

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph numbered [0005] with the following paragraph:

[0005] Pursuant to the present invention, an electric motor has an output shaft with generally circular peripherally indented discs of different diameters mounted thereon. Torque is applied to the output shaft by engagement of the discs with push rods projecting from electromagnetic actuators positioned in angular spaced relation to each other about the output shaft on rail supports anchored to a rheological brake unit through which the output shaft extends. Under control applied through magnetic fields to rheological fluid within the brake unit, braking effect is removed from the disc plates during a free-wheeling operational phase. Electrical energy is also applied to the actuators for mechanically imparting torque to the output shaft through the push-rods engaging one of the peripheral indented disc plates selected under stroke control for selectively varied conversion of drive force into the torque applied to the output shaft.

Please replace paragraph numbered [0012] with the following paragraph:

[0012] As shown in FIG. 2, the torque drive imparting assembly 24 includes four actuator units 28 positioned in 90° angular relation to each other about the shaft 12. Each of such actuator units 28 includes a pair of cylindrical actuator devices 30 held in close parallel spaced relation to each other within a support 32. Each of the actuator supports 32 as shown in FIGS. 1 and 2 is adjustably positioned within an elongated rail 34. The actuator supports 32 are shown positioned at an outer ends 36 opposite an inner ends 38 of the rails 34 anchored to the unit 18. Each rail 34 accordingly extends in angular relation to the axis 40 of the shaft 12 as shown in FIG. 1, radially spaced therefrom by an ~~increasing~~ amount which increases from the anchored rail ends 38 to the opposite rail ends 36 at which the actuator devices 30 are positioned in alignment with a large

diameter force transfer wave plate 42 splined to the shaft end section 26 and having an indented periphery 44. Projecting from each of the cylindrical actuator devices 30 is a driving push rod 46, for engagement with the indented periphery 44 of the waveplate 42 so as to impart a torque force to the shaft 12 through the waveplate 42.

Please replace paragraph numbered [0013] with the following paragraph:

[0013] As shown in FIGS. 1 and 3, also positioned on and splined to the small diameter end section 26 of the shaft 12 in abutment with the plate 42 is a smaller diameter force transfer disc wave plate 48 to form therewith force transfer means. Each of the actuator units 28 may accordingly be displaced on its support 32 along the shaft axis 40 at an angle thereto from the position at the end 36 of its rail 34 as shown in FIG. 3 to a position with the push rod 46 in alignment with the smaller diameter waveplate 48 to be engaged so as to effect a change in stroke of the drive forces applied to shaft 12 by the actuator driven push rods 46 through the radially smaller waveplate 48, as compared to the drive stroke transferred to the shaft 12 through the larger diameter waveplate 42. Such repositioning of the actuator units 28 on the rails 34 along the paths extending in angular relation to the shaft axis 40 is effected by positioning adjustment devices 50 respectively mounted on each of the rails 34 and connected to the actuator unit supports 32 as shown in FIGS. 1 and 3.

Please replace paragraph numbered [0014] with the following paragraph:

[0014] With continued reference to FIG. 3, the unit 18 is shown positioned on an intermediate larger diameter hollowed rotor section 52 of associated with the shaft 12 extending between the shaft end sections 20 and 26. The unit 18 includes an outer cylindrical housing 54

positioned on the section 52 in abutment with the thrust bearing component 22 at one axial end opposite ~~its other~~ an axial housing end plate 56. The ends 38 of the rails 34 are anchored to the housing end plate 56. The housing 54 is thereby fixedly anchored in position on the ~~shaft rotor~~ section 52 for rotational support of the shaft 12 on its axis 40 about which the shaft 12 is rotated relative to the housing 54 ~~about its axis 40~~. Enclosed within the housing 54 are chambers 58 filled with a magneto-rheological fluid in surrounding relation to the shaft section 52 which is peripherally formed with splines 60 through which a pair discs 62 within the chambers 58 are positioned rotationally fixed to the shaft 12 by the ~~shaft rotor~~ section 52. An electromagnetic coil 64 is also positioned within the housing 54 overlying a pair of permanent magnets 55, to partially or fully negate the braking effect thereby applied to the shaft 12 by the magnetic fields of the magnets 55 within the chamber 58 for free wheeling purposes. The magneto-rheological fluid filing the chamber 58 within such magnetic fields are established provides variable braking resistance to rotation of the shaft 12 through the discs 62.

Please replace paragraph numbered [0015] with the following paragraph:

[0015] As diagrammed in FIG. 4, an electrical power source 64 supplies electrical energy through timing phase control 66 to the four pairs of actuator devices 30 associated with the drive torque imparting assembly 24 from which the generated drive forces are transferred through the waveplate 42 or 48 as torque applied to the output shaft 12. The electrical energy from the source 64 is also supplied through control 66 to the positioning devices 50 for adjustable displacement of the drive torque imparting assembly 24 between its positions respectively aligned with the waveplates 42 and 48 for stroke change purposes. Finally, through the free-wheel control 68, electrical energy from the source 64 is applied to a coil 62 in the unit 18 during power-off phase

Appln. No. 10/807,580

Amendment in Reply to the Office action dated May 13, 2005

of operation with respect to drive of the output shaft 12 by the actuators 30, to negate the rotational resistance imposed by the unit 18 on the output shaft 12 for free-wheeling purposes.